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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,812	01/30/2004	Yu-An Li	BHT-3244-25	3138

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TROXELL LAW OFFICE PLLC
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EXAMINER	
LIN, JAMES	

ART UNIT	PAPER NUMBER
1762	

MAIL DATE	DELIVERY MODE
08/24/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/766,812	LI ET AL.	
	Examiner	Art Unit	
	Jimmy Lin	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) *1-5* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *6-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Invention II, claims 6-10 in the reply filed on 7/12/2007 is acknowledged.

2. Claims 1-5 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 7/12/2007.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 6-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitations "the solvent" in line 8. There is insufficient antecedent basis for this limitation in the claim.

Claim 10 recites the limitations "the electrical powder" and "the binder" in lines 23 and 24, respectively. There is insufficient antecedent basis for these limitations in the claim.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hibino et al. (U.S. Patent No. 6,800,010).

Hibino teaches a method of spraying phosphor ink from a nozzle onto a substrate. Phosphor powder is mixed with solvent in order to form phosphor ink (col. 12, lines 28-35). The phosphor ink is deposited on the anode (Figs. 1-2).

Hibino does not explicitly teach vaporizing the solvent within the range of predetermined temperatures. However, the deposition step occurs over a finite period of time and at least some of the solvent will necessarily evaporate because of the relatively high volatility of solvents.

Hibino does not explicitly teach repeating the steps of spraying the phosphor and vaporizing the solvent. However, additional spraying of the phosphor would yield predicable results of increasing the thickness of the phosphor layer. Additionally, repetition of the deposition step was well known to those of ordinary skill in the art to create a layer of desired, even thickness. It would have been obvious to one of ordinary skill in the art at the time of invention to have repeated the spraying of the phosphors onto the substrate in order to have formed a phosphor layer with a desired thickness. The repetition of the phosphor spray would have necessarily created an additional step of vaporization of the solvent because the solvent would necessarily evaporate due to its volatility.

Claims 7-8: The phosphor layer is exposed to a firing process at a temperature of around 500 °C (col. 12, lines 37-38). The hardening of the film allows the phosphor to adhere to the substrate.

8. Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun et al. (U.S. Patent No. 6,447,908).

Yun teaches a method of depositing a phosphor onto a substrate of a field emission display. Phosphor particles are mixed with a solvent and can be formed on the substrate via a spraying method (abstract; col. 5, lines 16-22; col. 7, lines 17-20). The substrate being coated is an anode (col. 2, lines 45-46).

Yun does not explicitly teach vaporizing the solvent within the range of predetermined temperatures. However, such vaporization must necessarily occur for substantially the same reasons discussed above.

Yun does not explicitly teach repeating the steps of spraying the phosphor and vaporizing the solvent. However, such repetition of steps is obvious for substantially the same reasons as discussed above.

Claim 9: Yun does not explicitly teach wherein the phosphor spray is applied by a commercial spray gun. However, using a commercial spray gun (such as ATD Tools 6836 gravity feed spray gun, which has a nozzle diameter of 1.4 mm, an air flow rate of 160-300 L/min, and a solvent flow rate of 150-260 cc/min) was well known to those of ordinary skill in the art to simplify a spraying method, and hence would have been obvious to incorporate into the method of Yun.

9. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yun '908, as applied to claim 6 above, in view of Chadha et al. (U.S. Patent No. 5,744,907).

Yun is discussed above, but does not explicitly teach a step of providing an adhesive process to obtain a phosphor layer. However, Chadha teaches that it is well known in the art of forming a phosphor layer in a field emission device to add a binder to the phosphor material (abstract; col. 2, lines 65-67). The binder is exposed to a heating process (i.e., a sintering process) so that the binder binds the phosphor particles to each other and to the substrate (col. 2, lines 42-45; col. 3, lines 5-9). Because Chadha teaches that the addition of such binders to a phosphor layer is operable in the art, it would have been obvious to one of ordinary skill in the art at the time of invention to have added the binders of Chadha to the phosphor spray of Yun with a reasonable expectation of success. One would have been motivated to do so in order to have bound the phosphor particles to each other and to the substrate.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yun '908in view of Chadha '907 as applied to claim 7 above, and further in view of Kendall et al. (U.S. Publication No. 2003/0017797).

Yun and Chadha are discussed above. Yun teaches that the phosphor particles can have a particle size of 0.5-20.0 μm (col. 6, lines 47-50) and that the electrical powder can also be 0.5-20.0 μm (col. 6, lines 57-58).

Chadha teaches the use of binders but does not explicitly teach any particle size of the binders, much less that a particle size can be less than about 0.2 μm as claimed. However, Chadha does teach that polyvinyl alcohol (PVA) can be the particular binder. Kendall teaches that PVA can have particle sizes ranging from 0.05-500 μm [0044]. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to have used PVA as the particular binder with a particle size between 0.05 and 0.2 μm with a reasonable expectation of success because Kendall teaches that such a range of particles sizes is well known for PVA.

Yun does not explicitly teach that the phosphor layer coated on the anode has a thickness of between about 1.5 and 2.5 μm. However, Yun does teach that the phosphor layer can be two phosphor particles in thickness (Fig. 3B). Considering that Yun teaches particle sizes of the phosphor particles to be in the range of 0.5-20.0 μm, the two-phosphor particle layer would have a thickness in the range of 1.0-40.0 μm.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jimmy Lin whose telephone number is 571-272-8902. The examiner can normally be reached on Monday thru Friday 8AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tim Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JC
JL

FREDDA PARKER
PRIMARY EXAMINER